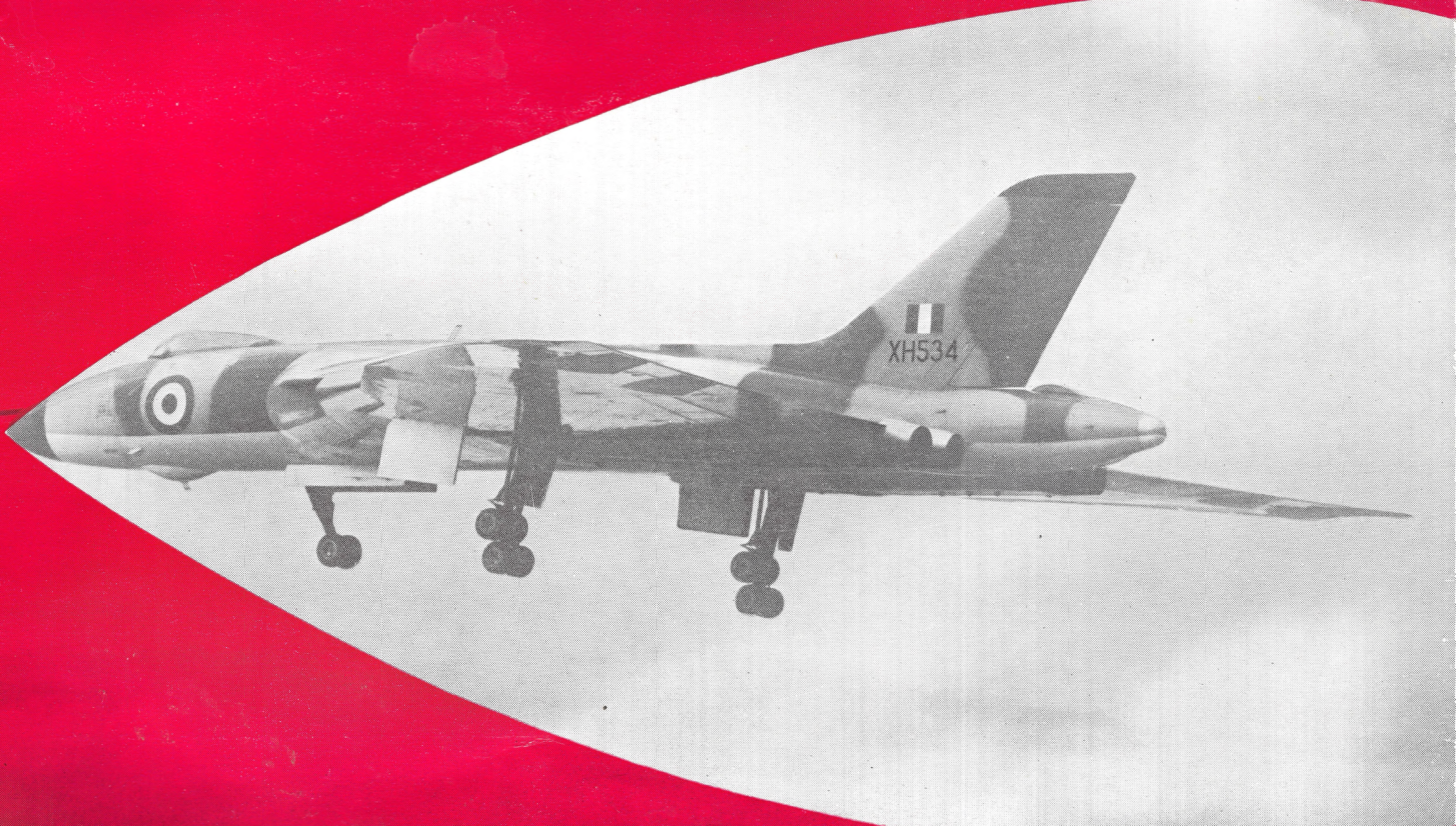
# AIR SHOW NUMBER

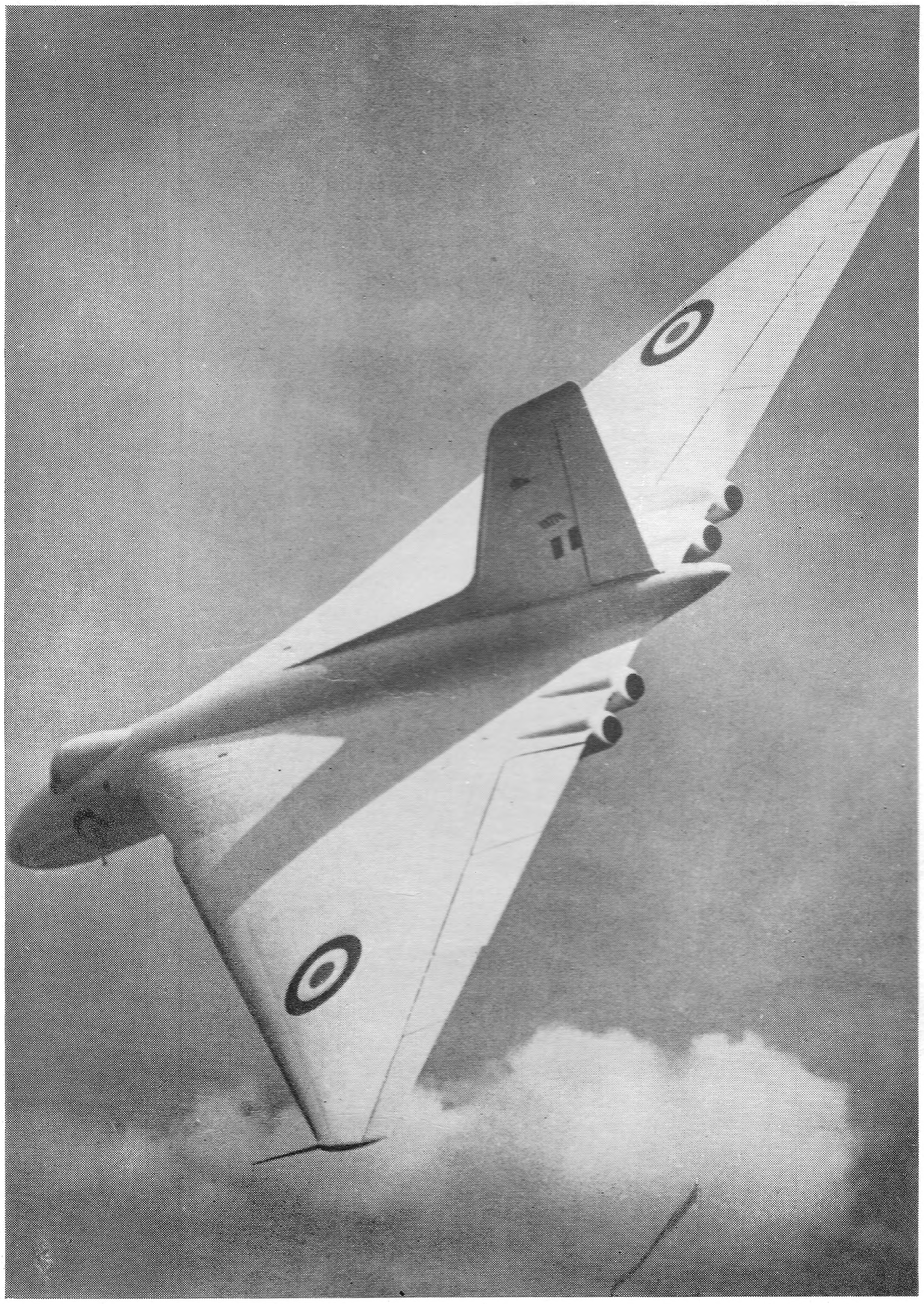
including the

# CONCORDE

B.A.C. JET PROVOST T3
B.A.C. SUPER VC10
B.A.C. 221
BOEING 707
BOEING 747
BUCCANEER S1
ENGLISH ELECTRIC LIGHTNING F3
GLOSTER JAVELIN
HANDLEY PAGE VICTOR B2
HAWKER SIDDELEY BUCCANEER
HAWKER SIDDELEY COMET 4
HAWKER SIDDELEY SEA VIXEN FAW 1
HAWKER SIDDELEY VULCAN
HAWKER SIDDELEY P1127
VICKERS SUPERMARINE SWIFT
WESTLAND BELVEDERE HC1



SOUVENIR BROCHURE



## HAWKER SIDDELEY VULCAN

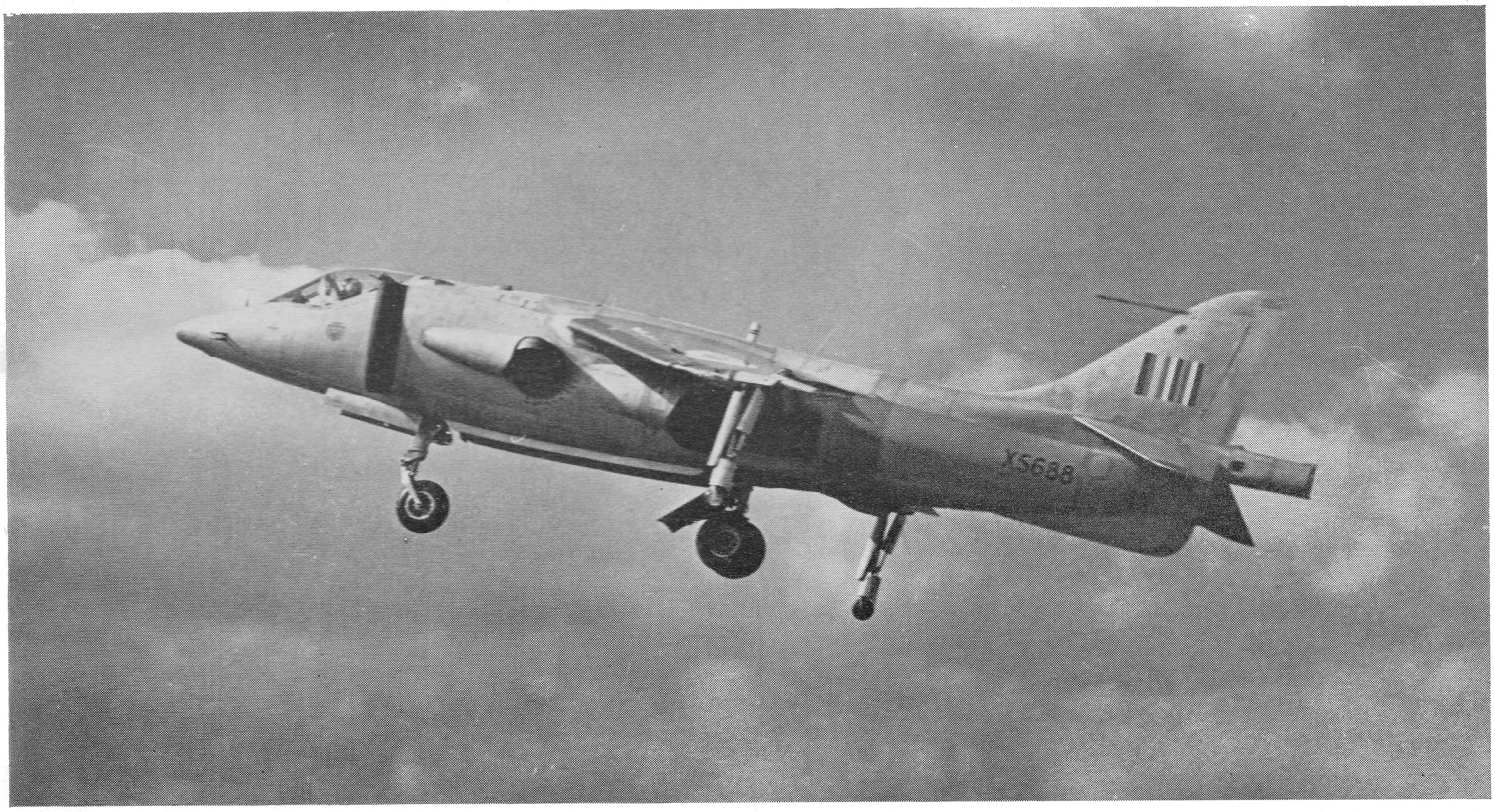
Powered by four Rolls-Royce Avon turbojets, first flew on August 30th, 1952, and went into service four years later with Squadrons 44, 50, 83, 101 and 617. The B2 version first flew in August 1958, and deliveries commenced in July, 1960.

The Vulcan B2 powered by four Bristol Siddeley Olympus B.01. 21 Mk. 301 turbojets each rated at 20,000 lb. s.t.

Maximum speed 645 m.p.h. Range 4,750 miles.

## WESTLAND BELVEDERE HC1

Powered by two 1,650 s.h.p. Napier 54 ft. 4 ins., rotor diameter each 48 ft. 8 ins. Maximum speed 138 m.p.h.

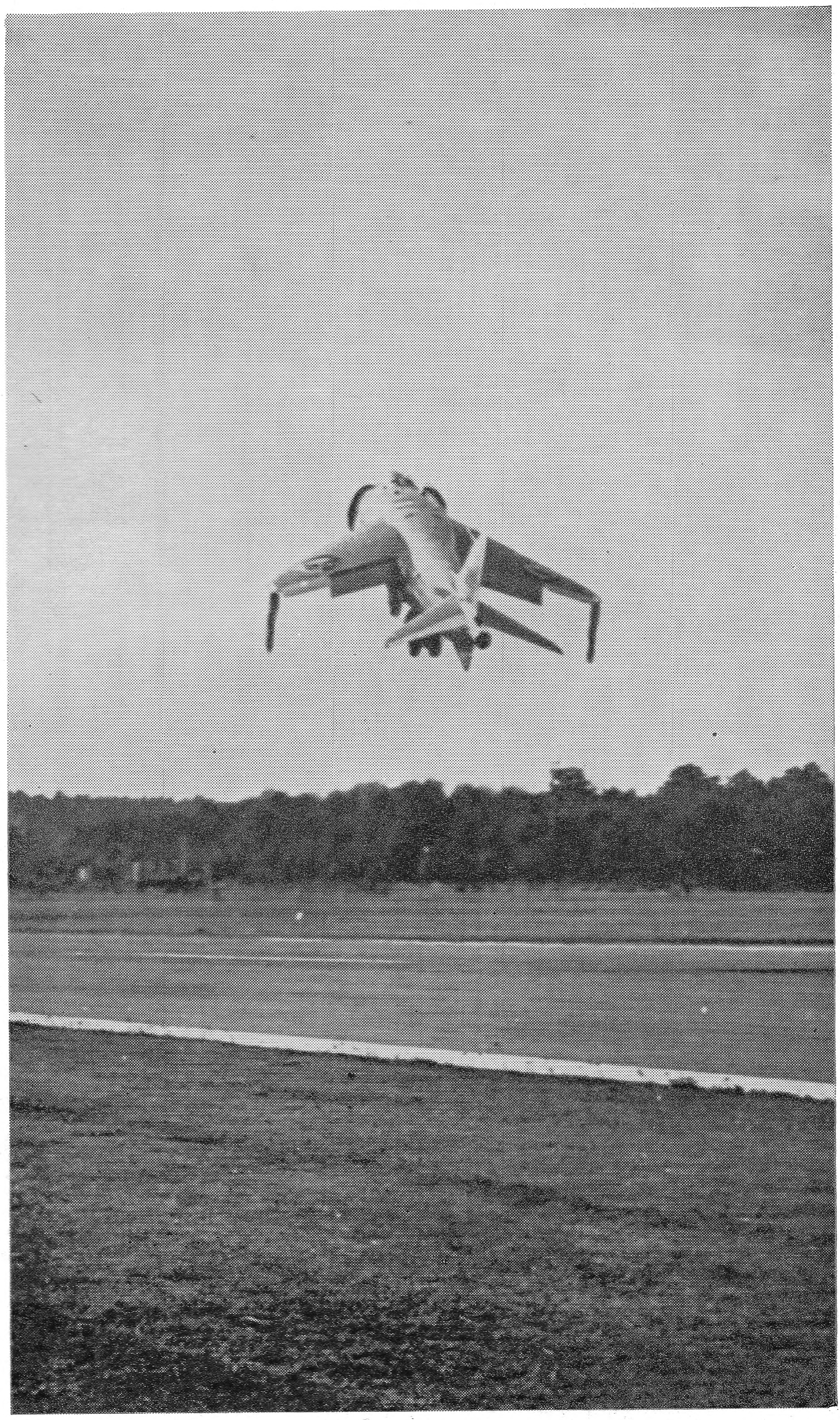


## HAWKER SIDDELEY P1127

A vertical and short take off-landing fighter, this plane flew for the first time on November 19th, 1960. Further prototypes were then built, all with slight differences and improvements. The design is based around the revolutionary Bristol Siddeley Pegasus Pg.5 vectored-thrust turbofan of over 15,500 lb. thrust.

Maximum speed of 660 m.p.h. at sea level, a wing span of 22 ft. 10 ins., length 42 ft. 0 ins.

Our picture on the right shows the P1127 as it hovers motionless and above the transition is complete from horizontal to vertical flight. Developed version called Harrier, ordered for R.A.F.



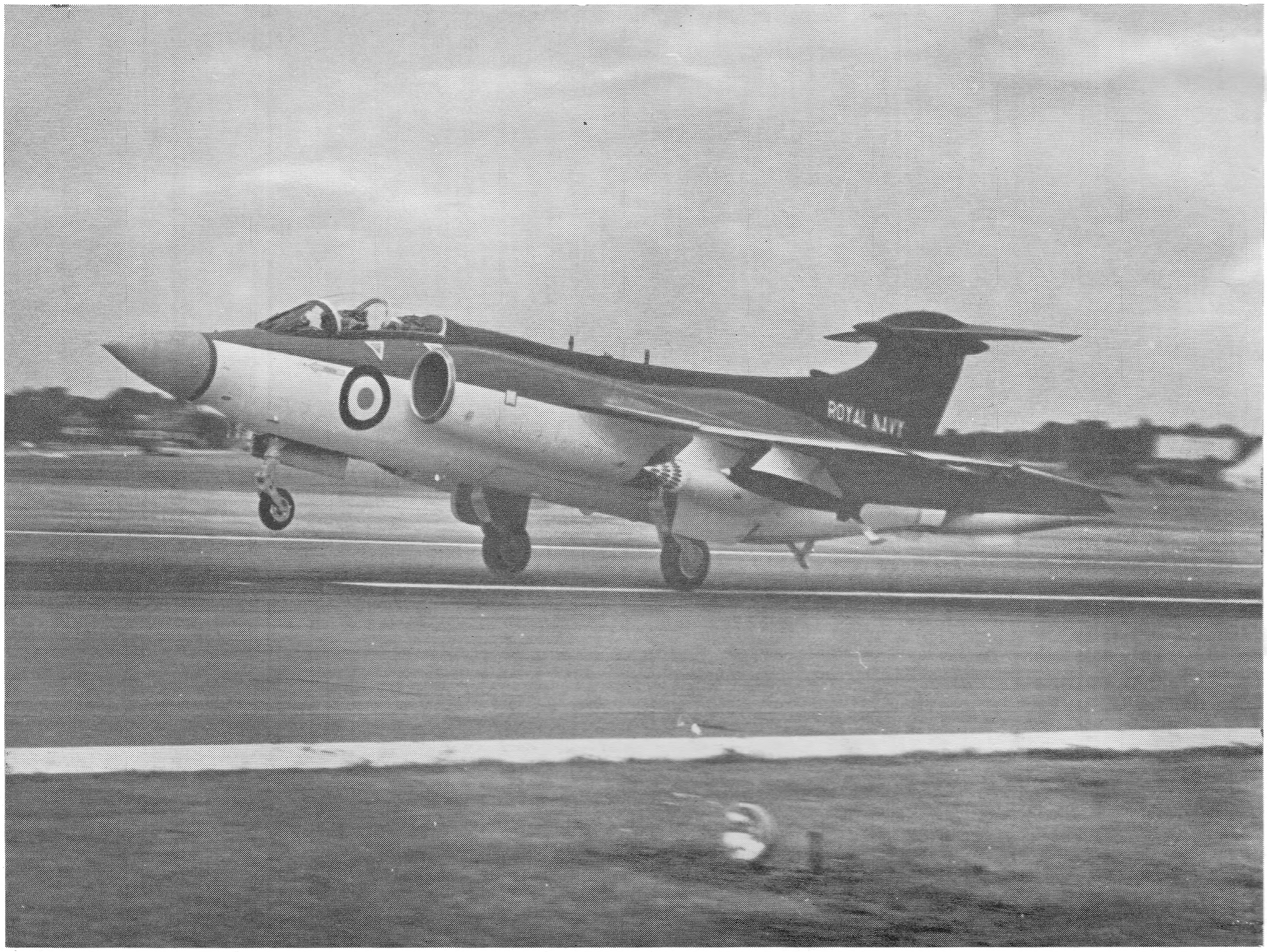
# HAWKER SIDDELEY BUCCANEER

The S.Mk.2 version of the Buccaneer, powered by two Rolls-Royce RB 168—17 Spey R.Sp.2 turbofans, each rated at 11,030 lb. s.t., was flown for the first time on June 5th, 1964. An approximate maximum speed of 665 m.p.h. at sea level (Mach 0.9). Cruising speed of approximately 460 m.p.h. with an operational range in the region of 4,000 miles.

The wing span is 42 ft. 4 ins., length 63 ft. 5 ins., height 16 ft. 6 ins., approximate loaded weight of 40,000 lbs.

Earlier two Spey-engined conversion, pre-production S Mk. 1s have given service with the Nos. 800, 801 and 809 Squadrons of the Royal Navy.

Four 1,000 lb. bombs on large single store in weapons bay, additional offensive stores or four 1,000 lb. capacity underwing pylons. Reconnaissance pack housing six cameras may be mounted in weapons bay.

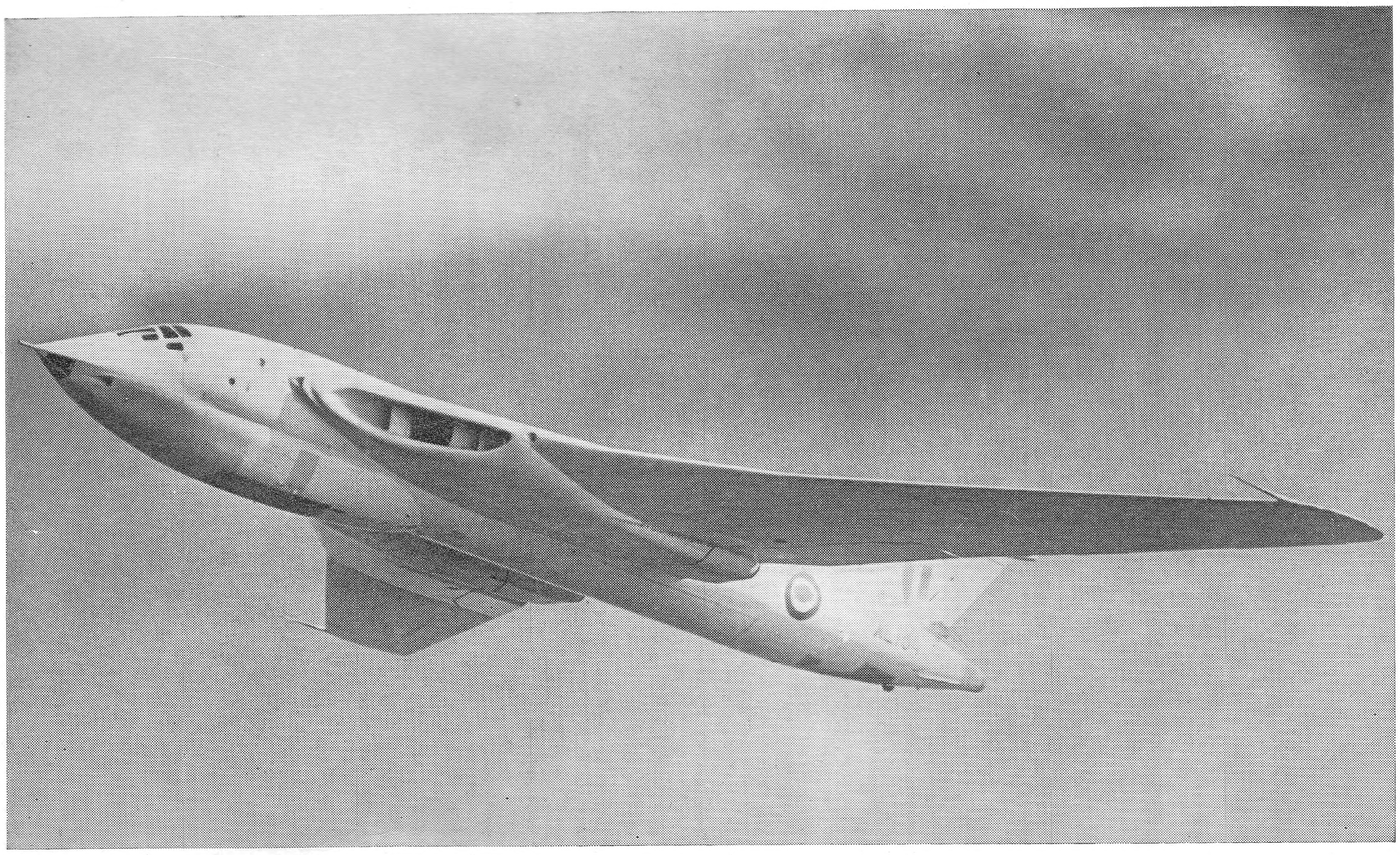


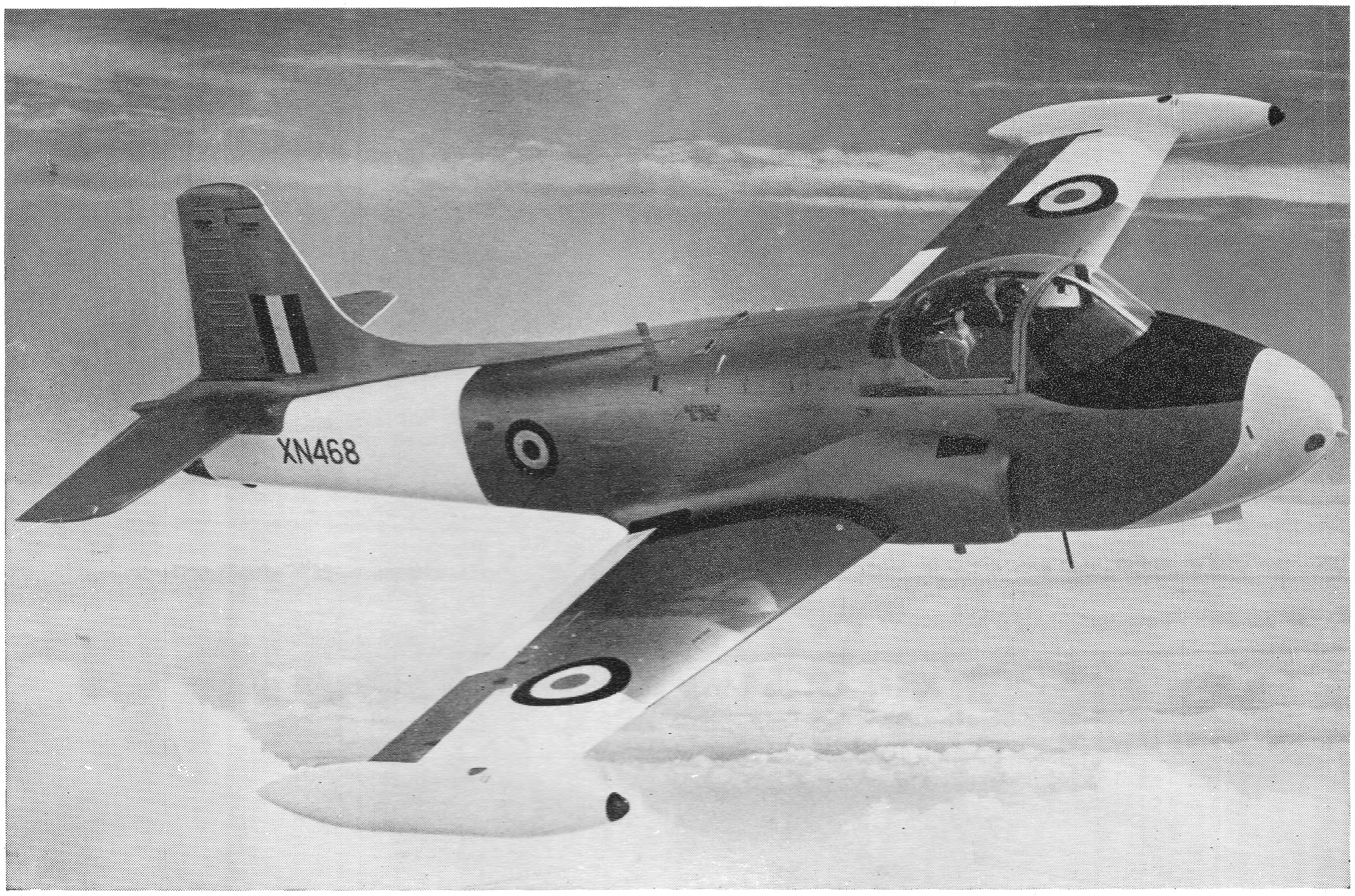
## GLOSTER JAVALIN

Powered by two 11,000 lb. s.t. Bristol Siddeley Sapphire 203/204 turbojets (12,300 lb. with reheat). Wing span is 25 ft., length 56 ft. 9 ins. Maximum speed over 600 m.p.h. Night and all weather fighter.

## HANDLEY PAGE VICTOR B2

Powered by four Rolls-Royce Conway R. Co. 17 Mk. 201 turbofans rated at 19,750 lb. s.t., estimated maximum speed 630 m.p.h. Wing span 120 ft., length 114 ft. 11 ins. Production completed but conversion of B Mk. 25 to 3 (S.R.) Mk. 25 continued until the end of last year.



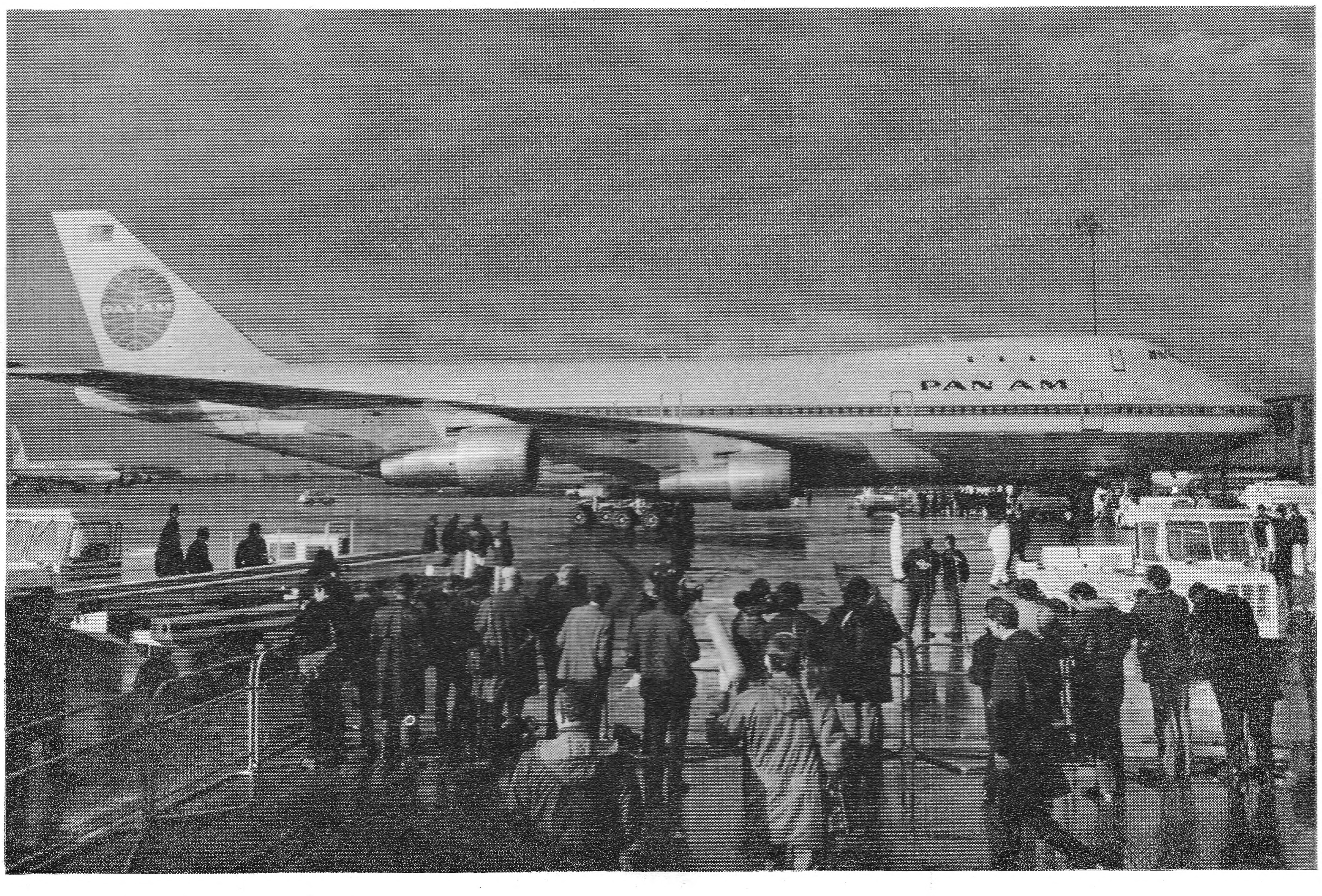


## B.A.C. JET PROVOST T3 R.A.F. BASIC TRAINER

Powered by one Bristol Siddeley Viper 102 (ASV 8) turbojet, maximum speed of 326 m.p.h. Wing span of 36 ft. 11 ins. Length 32 ft. 5 ins. Maximum range 565 miles.

## BOEING 747

The first Jumbo Jet to arrive in England, January 22nd, 1970. The Boeing 747 is the largest commercial air transport ever built.

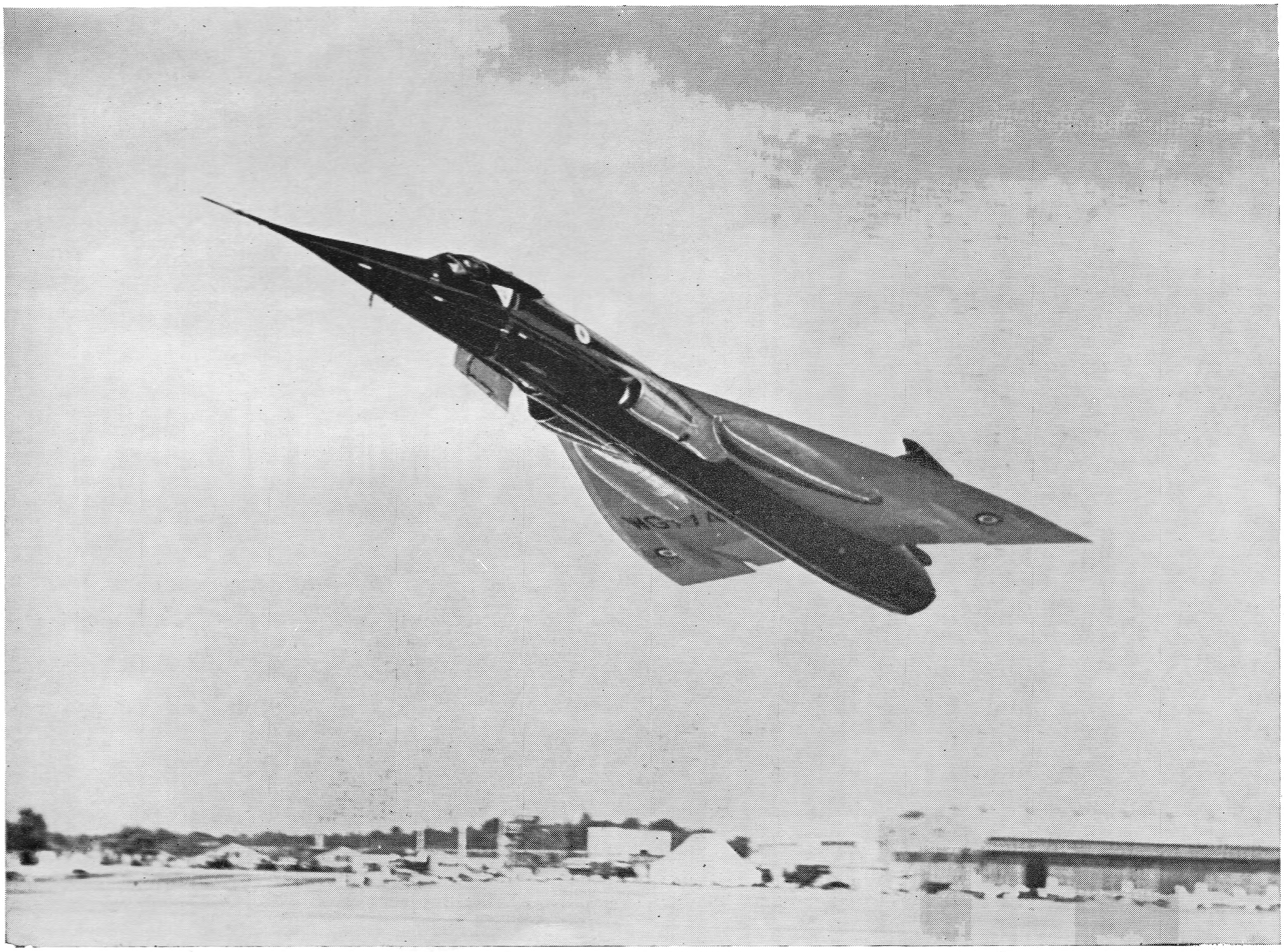


# B.A.C. 221

One Rolls-Royce Avon RA28 turbojet rated at 10,050 lb. s.t. powers the B.A.C. type 221 which, with a wing span 25 ft., was built primarily to investigate the handling properties of the slender delta wing configuration as part of the development of the B.A.C. Sud Concorde supersonic transport.

Other dimensions and technical details include length 57 ft. 7½ ins., height 11 ft. 4½ ins. With an estimated maximum speed of 1,060 m.p.h. at 40,000 ft. (Mach. 1.6) and an approximate ceiling of 70,000 ft.

The basic research programme began, when first flown on May 1st, 1964, to explore the aerodynamic characteristics of the platform in the subsonic, transonic and supersonic speed ranges. Using the basis of the Fairey FD 2 supersonic research delta power plant and fuselage which has been lengthened by approximately six feet to accommodate the increased fuel tankage and to match the new wing of an approximate area of 500 sq. ft.



SUD AVIATION FRA
Concorde

# BAC SUD AVIATION CONCORDE

The Concorde is designed to accomodate up to 132 passengers, as well as cargo, and will be able to fly from London to New York in three hours.

The basic shape of the Concorde is hardly new. The wings will be in the delta or triangular shape seen on many planes today.

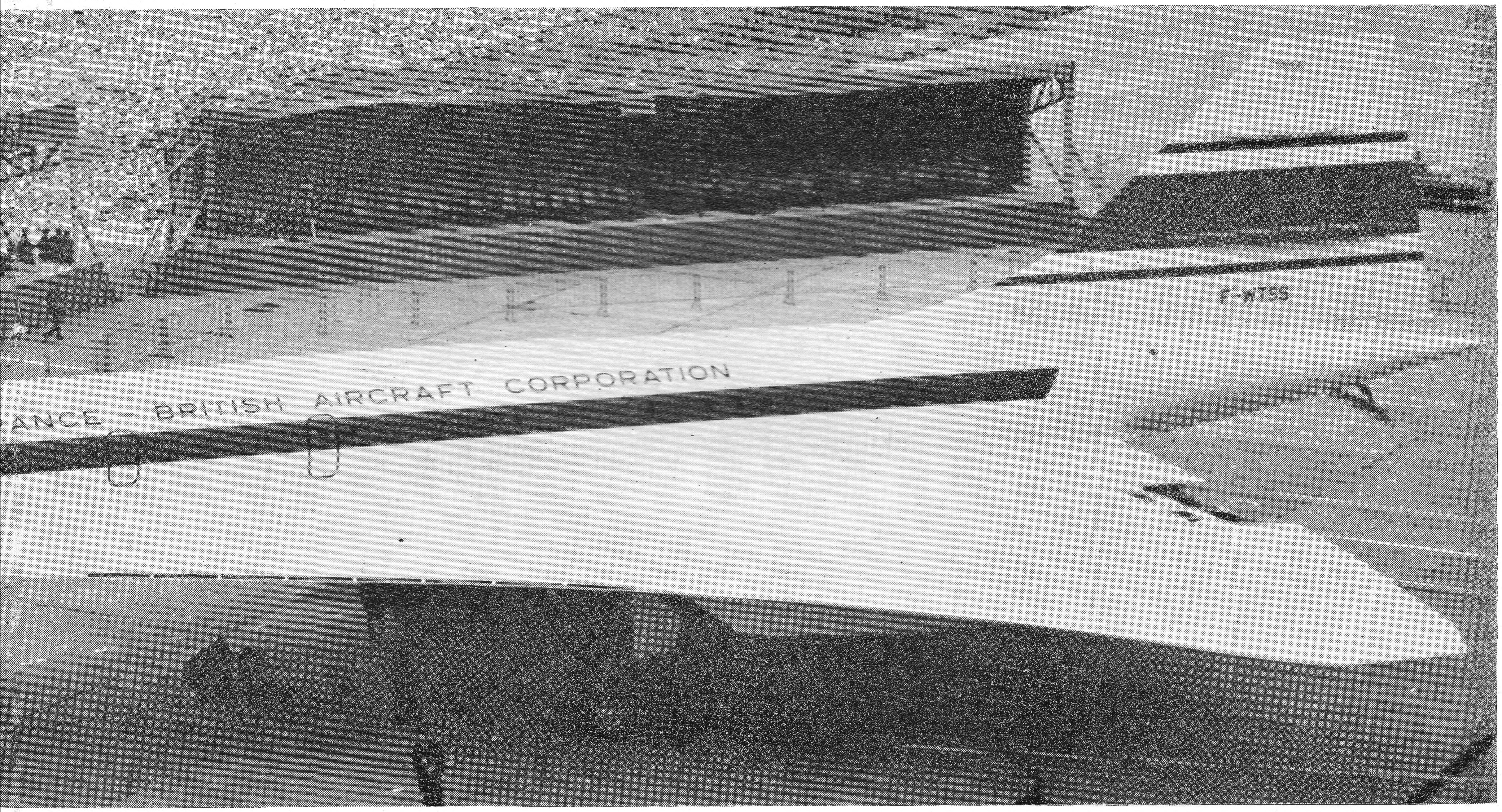
The Royal Aircraft Establishment at Bedford, England, devoted a great deal of research to this problem in the late 1950s and their efforts played a major role in creating the shape. This shape also has the advantage of not stalling the plane at low speeds.

The engines are based on those used in the Vulcan V-Bomber. The new engine being developed, the Olympus 593, will be capable of giving over 35,000 lbs. of thrust at take-off and it is hoped that even this will be improved on in later engines. Mounted in pairs underneath the wings they can be removed easily through large access doors for maintenance.

The Olympus 593 has a number of safety devices built into it which give warning of imminent failure, and inspection ports are provided in 25 places for easy examination of engine parts. Thus more than everage care is to be taken to ensure that engine failure at high speed does not cause a disaster.

At such high velocity of 1,450 m.p.h. the air-frame of the plane, the body, will have to withstand tremendous stresses. The testing of the Concorde air-frame is therefore the most exacting in the history of Civil aircraft. For the more technically minded it may be interesting to know that the basic material used in Concorde is something called Hiduminium RR 58—the French call it AU2GN—and it is available in different forms such as forgings and sheets.

The structure has been designed for easy construction. The main wing is in five main sections only. The long fuselage also divides into five main sections—nose, forward, intermediate, centre and rear. One of the most unusual features of the nose is that it dips down when the plane is



landing to give the pilot a better view. In flight the nose is raised to give a completely streamlined outline.

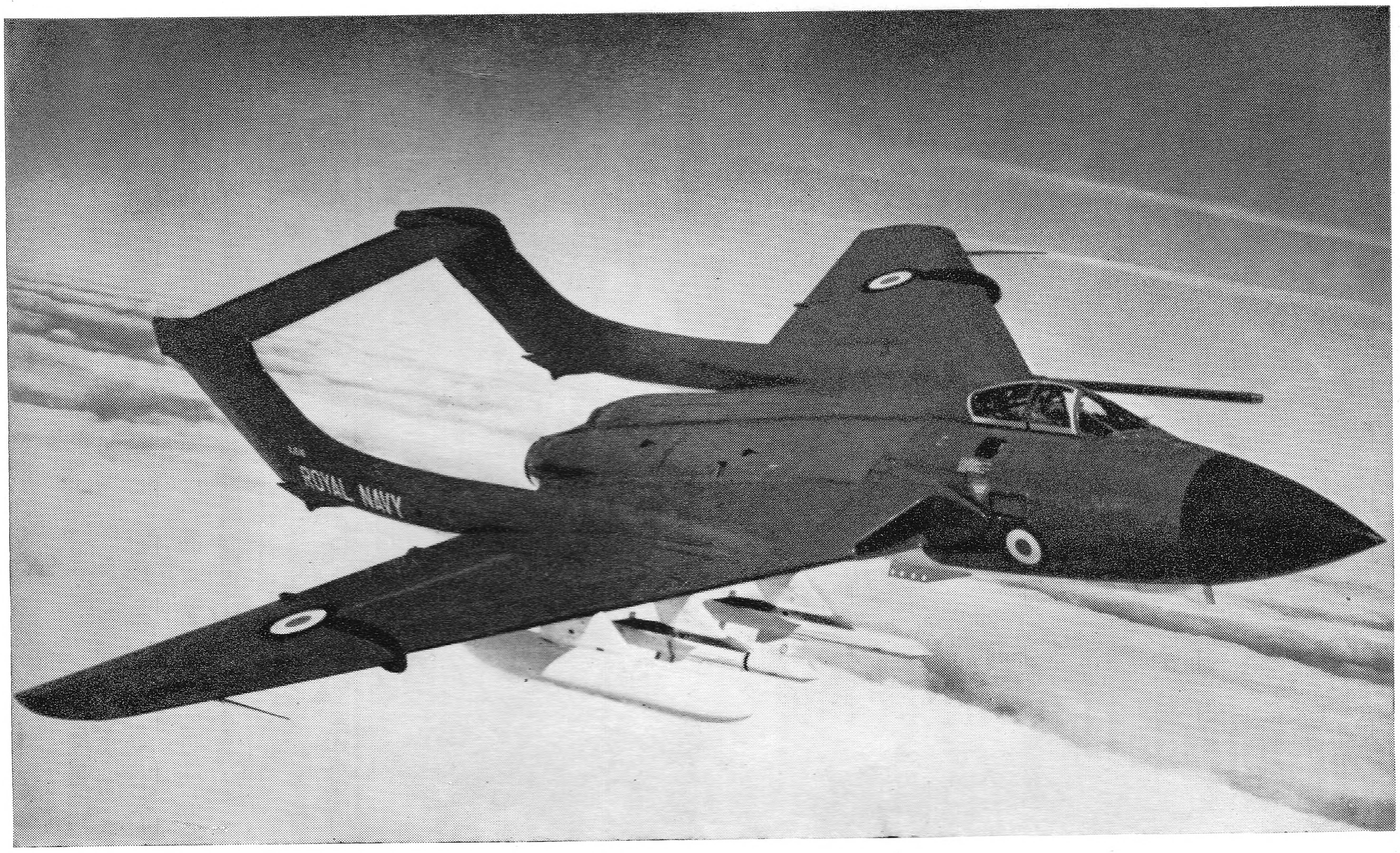
The aircraft control and navigation systems are fully automated and on a normal Concorde operation the entire flight is likely to be under automatic control—with the automatic take-off director, autopilot and auto-stabiliser and the automatic landing equipment controlling the appropriate phases of the flight plan—and the flight crew would be principally engaged in monitoring the operation. But, naturally, the pilots will have over-riding control.

The take-off is one of the most difficult times for a pilot so a computer will feed him information for a smooth take-off in any conditions. Landing is also difficult. Because of the length of the Concorde and the height of the pilot above the ground at touchdown, 35 feet, a slow landing approach will be used.

The handling of a plane at supersonic flight is tremendously important. Therefore, an automatic stability system is to be included which will keep the plane steady at all times.

In normal climb and descent the Concorde will fly at a height where ice will form on the wings; the Concorde will pass through these zones so quickly that only a very small amount of ice will be able to form. The Olympus 593 has already demonstrated that it can swallow large amounts of ice and slush with no ill-effects, but de-icing equipment near the engines will ensure that a large build-up does not occur. All windows are heated and the forward facing ones for the pilot can withstand the impact of a bird.

As well as the obvious use of providing power for the engines, the fuel system of the Concorde helps to trim the aircraft. It also helps to take away excess heat from other systems. In fact, nearly 60 per cent of the wing volume and half the volume underneath the floor of the passenger areas is taken up by fuel. Up to 17 separate tanks are available for fuel, and most of the equipment installed in them can be removed without draining the tanks. 250-ton full scale replica of this system has been built and is undergoing exhaustive tests.

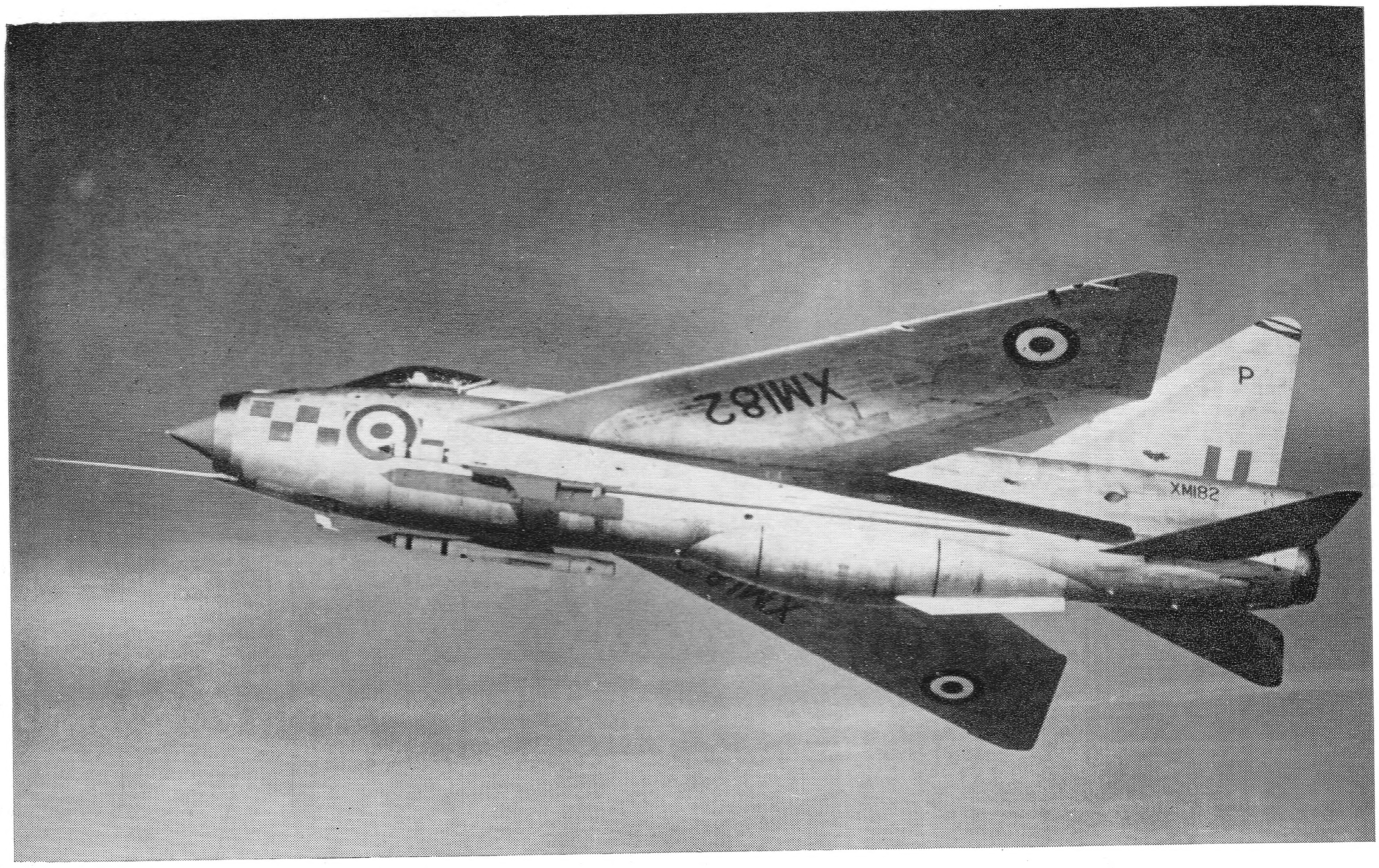


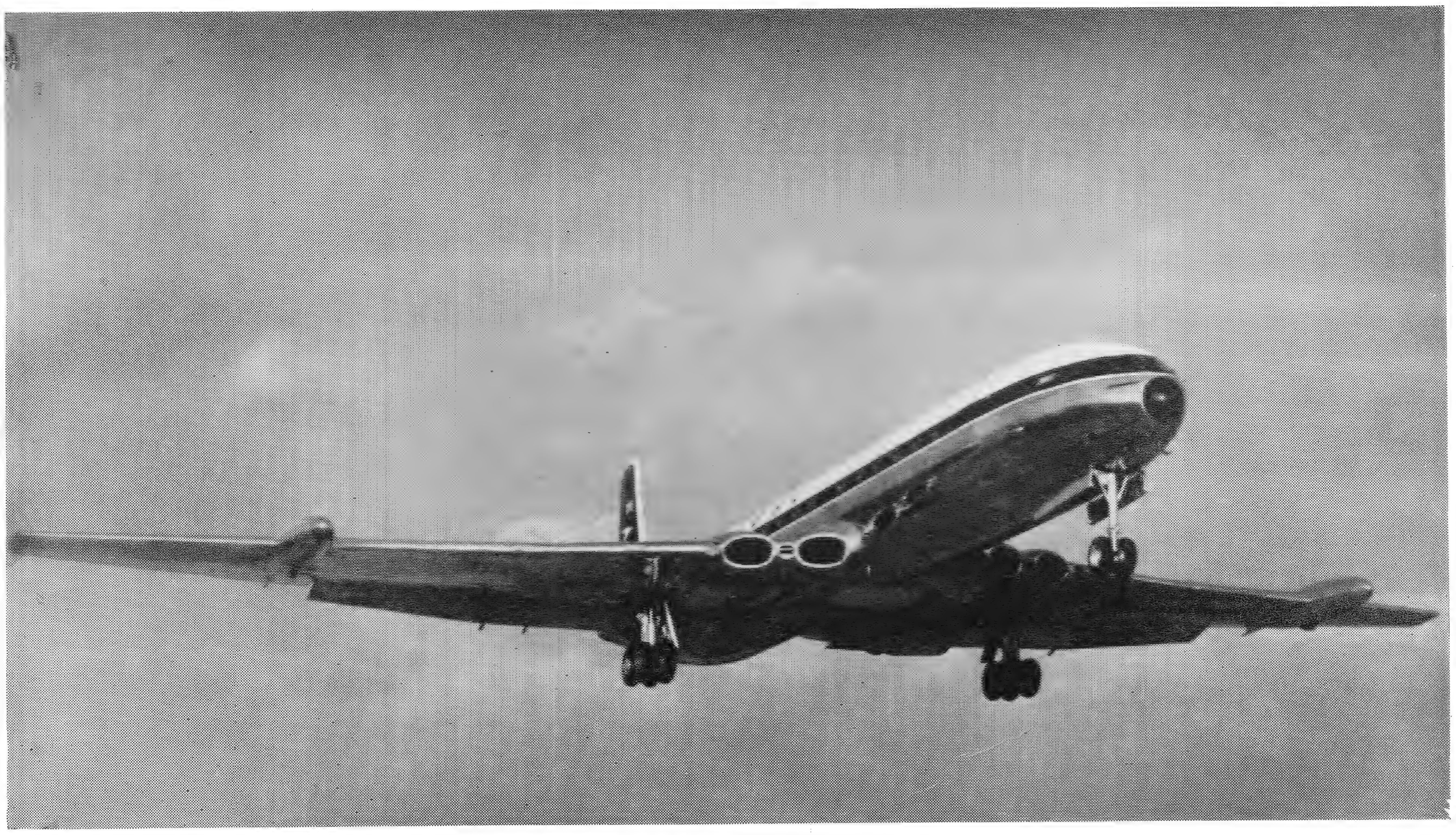
## HAWKER SIDDELEY SEA VIXEN FAW 1

Powered by two Rolls-Royce Avon Turbojets. Maximum speed 680 m.p.h. Wing span 50 ft. 0 ins., Length 55 ft. 7 ins.

## ENGLISH ELECTRIC LIGHTNING F1A

First flew on 4th August, 1954, with a maximum speed of approximately 1,400 m.p.h. Wing span 34 ft. 10 ins. Subsequent versions F Mk. 2 and the F Mk. 3.



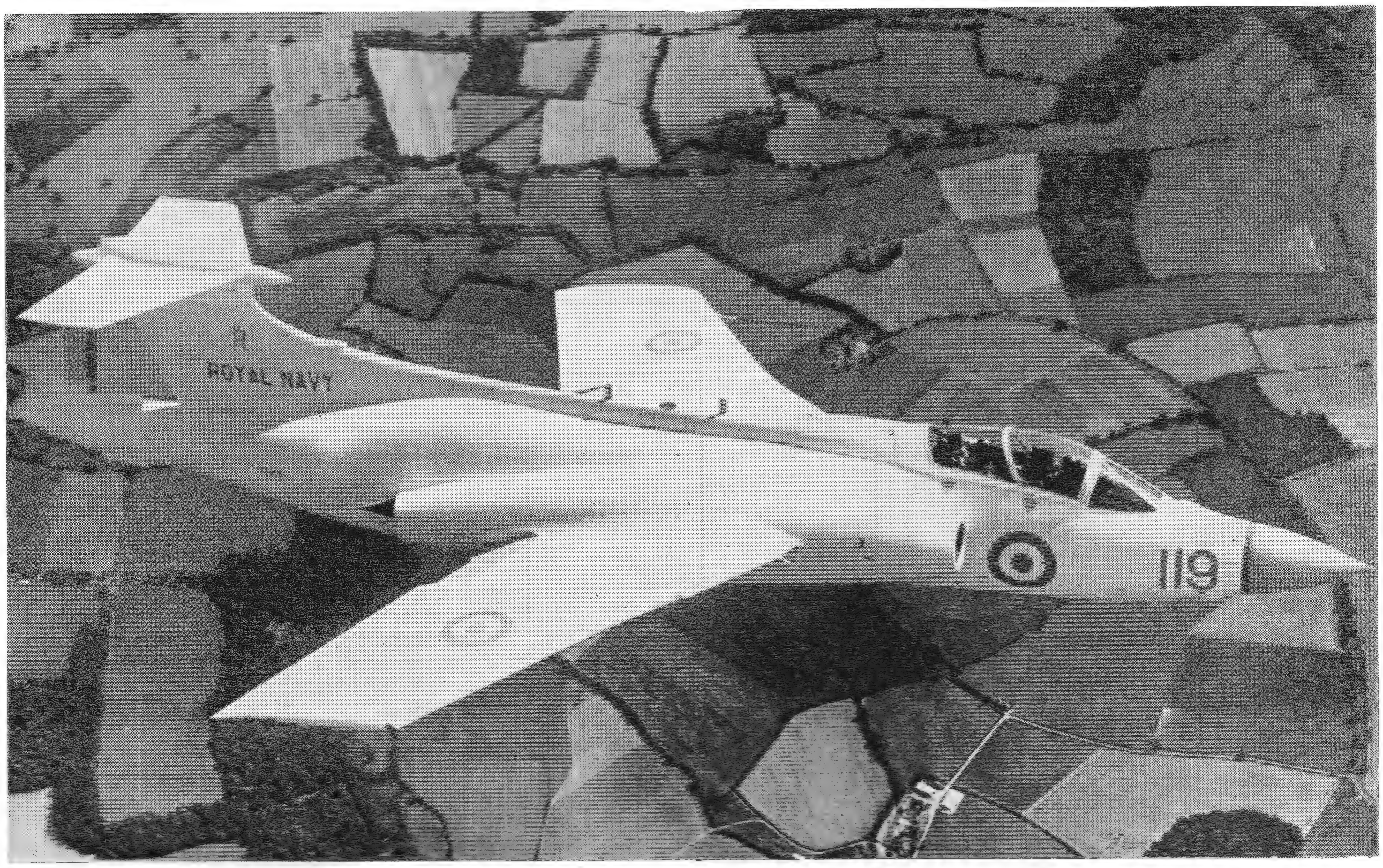


## HAWKER SIDDELEY COMET 4

Powered by four Rolls-Royce Avon Jet RA 29 engines. Various versions of the Mk. 4 have produced maximum speeds of 526—558 m.p.h. with a variation of wing span from 107 to 114 ft.

## BLACKBURN BUCCANEER S1

Powered by two Bristol Siddeley Gyron Junior turbojets.

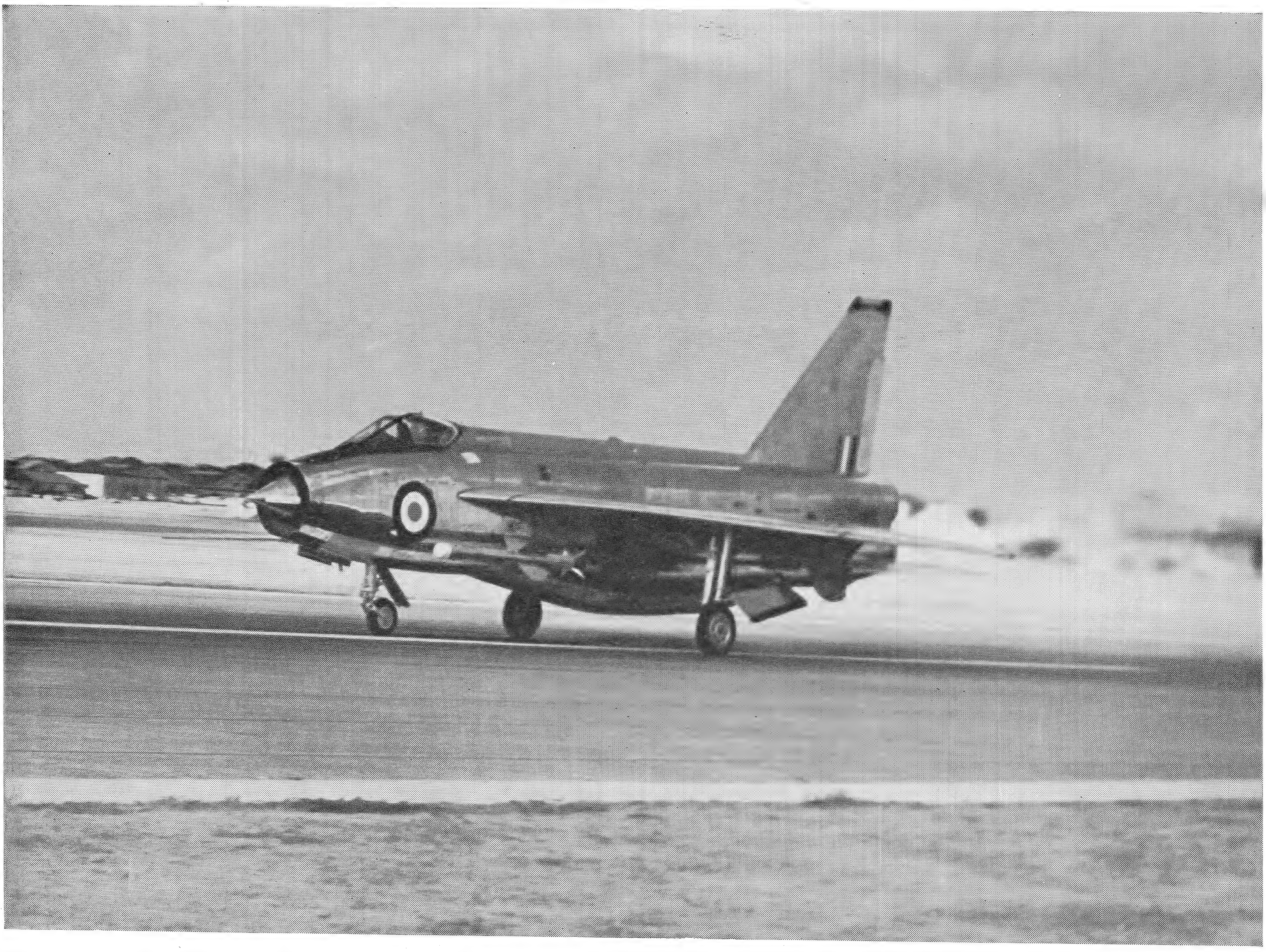


# ENGLISH ELECTRIC LIGHTNING F3

This latest version supercedes the Royal Air Force's first supersonic fighter, the original English Electric Lightning Mk. 1 which was powered by two Rolls-Royce Avon RA 24R engines. The current production version of the Lightning, the F Mk. 3 (shown below), powered by two Rolls-Royce Avon 301 turbojets, rated at 13,200 lb. s.t. and 16,000 lb. s.t. with after-burning. First went into service in 1964 with No. 74 Squadron R.A.F. Fighter Command.

Other modifications over the earlier versions include later Airpass radar allowing collision-course attacks with Red Top missiles, new angular vertical tail surfaces, and a modified wing configuration incorporating camber and a leading-edge extension, together with a substantially larger ventral fuel pack.

With an estimated maximum speed of 1,500 m.p.h. at 40,000 ft. (Mach. 2.0—2.2) and a cruising speed of between 530—600 m.p.h. Initial climb rate 50,000 ft./min.



# B.A.C. SUPER VC10

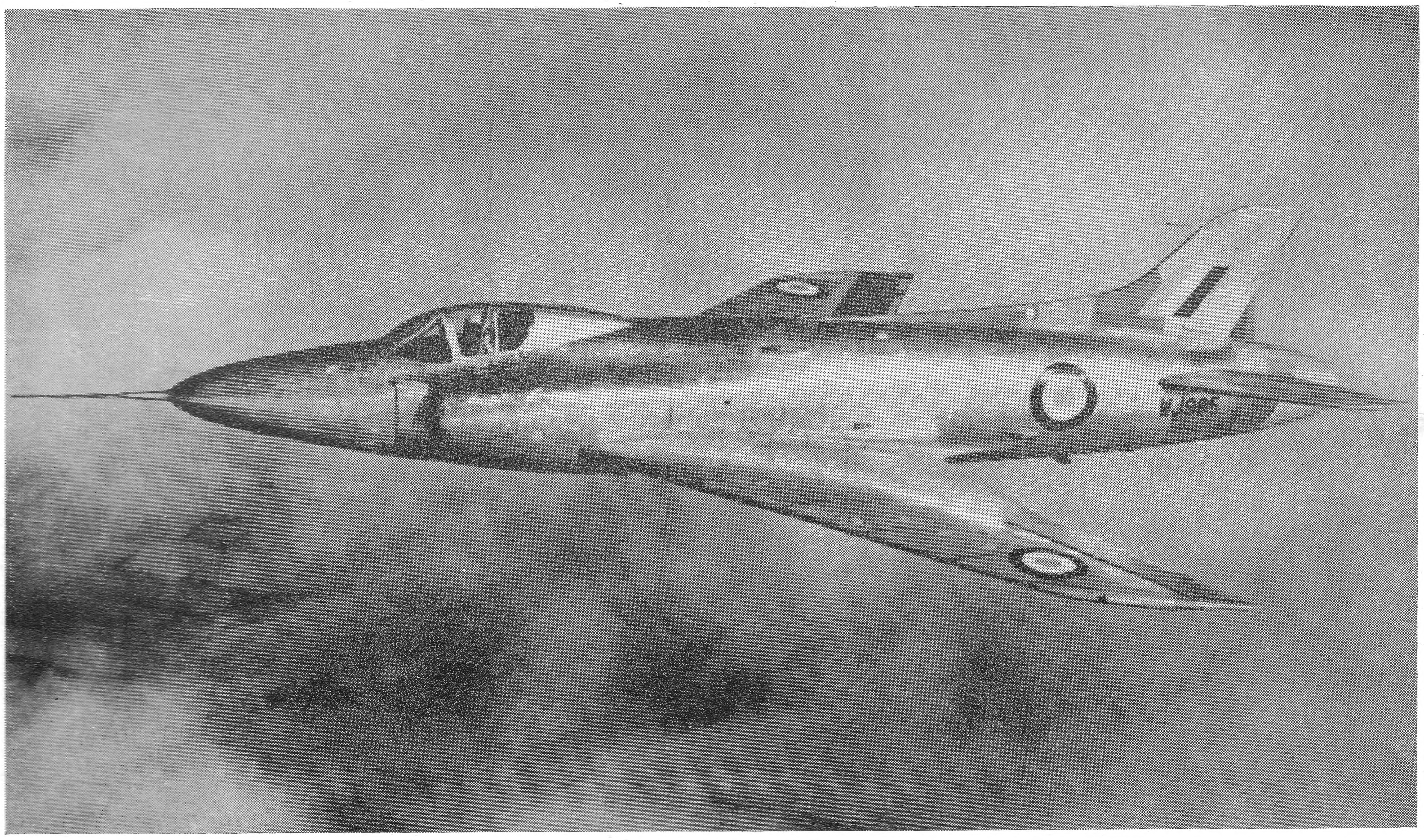
The Vickers Super VC10 a development of the earlier Vickers (B.A.C.) VC10, ideal for long stages and hot and high altitude airfields which make operating conditions especially difficult.

The four Rolls-Royce Conway R.Co.43 (Mk. 550) turbojets each rated at 22,500 lb. s.t. produce a maximum cruising speed of 568 m.p.h. at 36,000 ft. 6,644 miles with a pay load of 24,359 lb. or 4,594 miles at a pay load 57,759 lb. A long-range cruising speed of 550 m.p.h. at 38,000 ft. with a range of 4,594 miles at a pay load of 57,759 lb.

The Super VC10 which flew for the first time on May 7th, 1964, was ordered in various types for B.O.A.C., the Type 1152 as mixed passenger and freight with a freight loading door and reinforced floor, the Type 1151 being an all-passenger version. The type ordered for R.A.F. Transport Command is known as the 1106, and came into operation in July 1966, two months before schedule.

Wing span is 140 ft. 2 ins., length 171 ft. 8 ins. and height 39 ft. 6 ins.

The VC10 C. Mk. 1 flew for the first time in November 1965, was fitted with 4 Mk. 301 Rolls-Royce Conway F.Co.43 turbofans giving a maximum speed of 580 m.p.h. at 30,000.

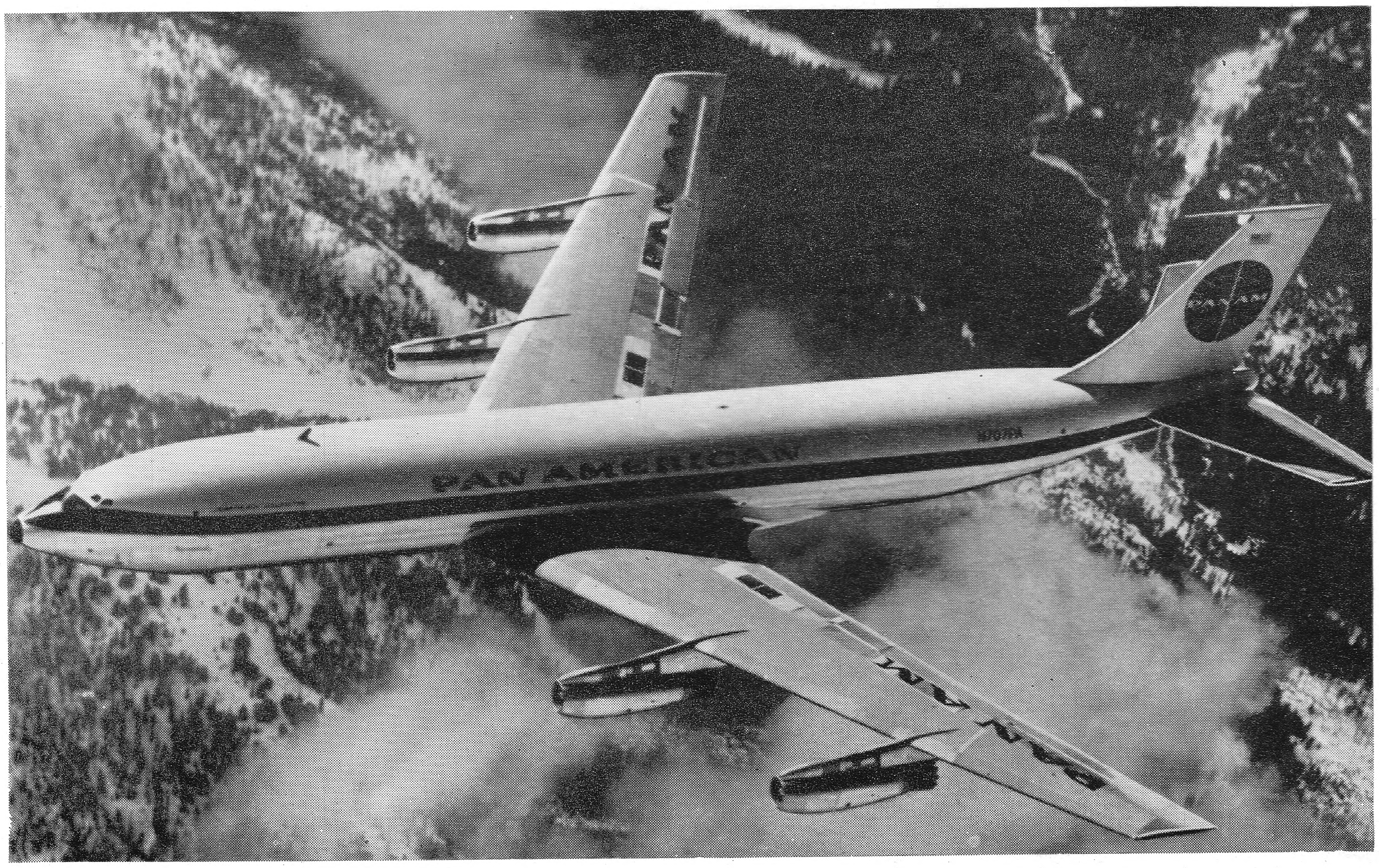


## VICKERS SUPERMARINE SWIFT

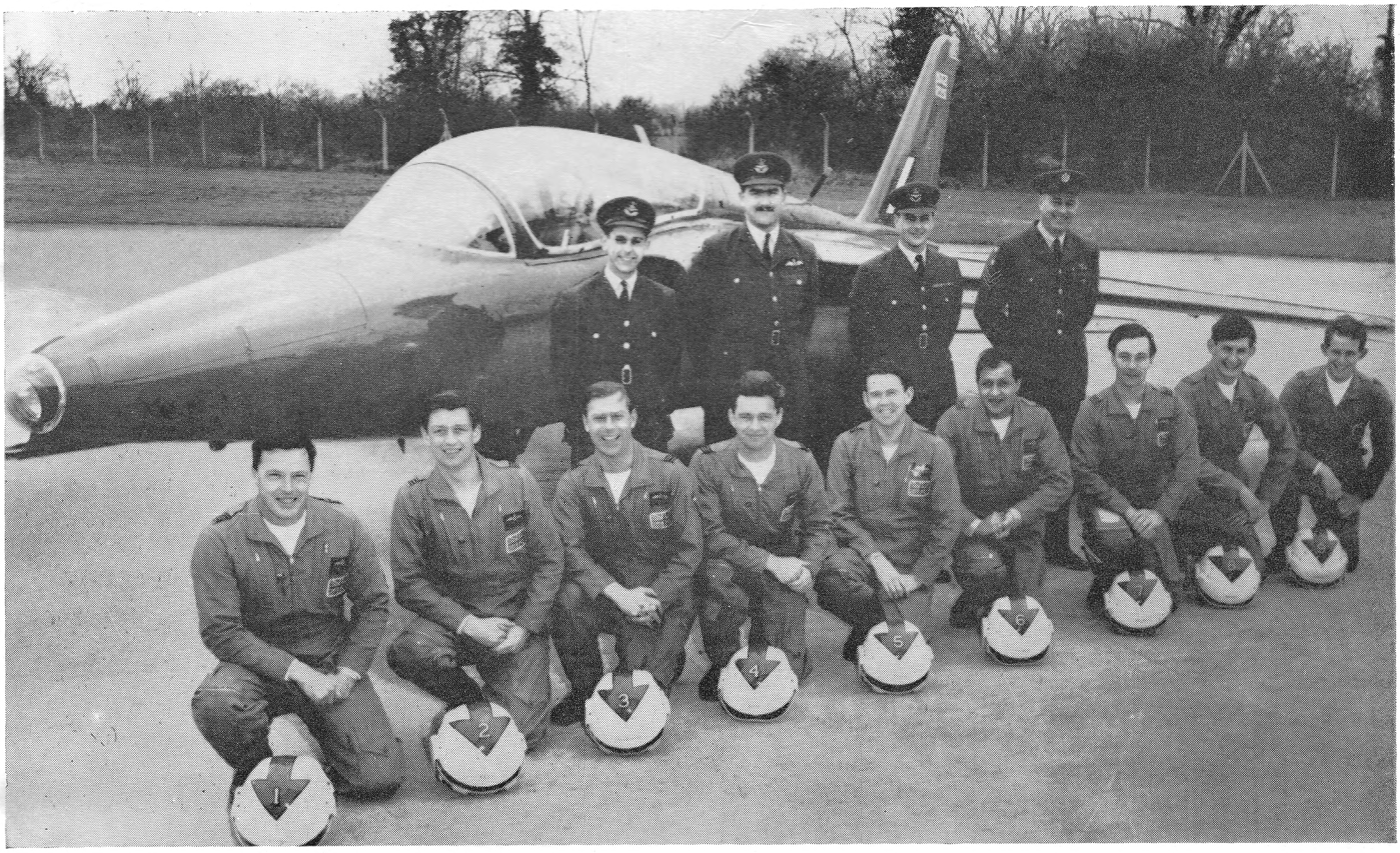
Powered by one Rolls-Royce Avon Turbojet. A Swift gained the world air speed record at 735.7 m.p.h. on the 25th September, 1953. The Swift F.R.5 served with R.A.F. as reconnaisance fighter.

## BOEING 707

Powered by four Pratt and Whitney JT3D-3B turbofans each of 18,000 lb. s.t. Built for long range commercial Transport the 707-320B type has a maximum passenger capacity of 189. A maximum speed of 615 m.p.h. at 23,000 ft. and long range cruising speed of 525 m.p.h. at 35,000 ft. The original model 707-320 with a longer fuselage and increased wing span.



# "THE RED ARROWS"



Back row left to right:
SQN. LDR. R. A. E. STORER, Team Manager. Joined RAF 1956. 66 and 83 Squadrons.
FG. OFF. C. HARROW, Technical Officer. Completed cadetship at RAF Technical College, Henlow.
FG. OFF. D. E. WHITBY, Technical Officer. Joined RAF 1938.
FLT. SGT. G. F. J. HUTSON, Senior NCO. Joined RAF 1936.

Front row left to right:
SQN. LDR. R. G. HANNA, Team Leader. New Zealander. Joined RAF 1949.
FLT. LT. D. A. BELL, Joined RAF 1964. 66, 142, 208 Squadrons. CFS Course.
FLT. LT. W. A. LANGWORTHY, Deputy Leader, Joined RAF 1953. 73 Squadron.
FLT. LT. P. R. EVANS. Joined RAF 1953. 60 and 9 Squadrons. CFS Course 1963.
FLT. LT. R. BOOTH. Joined RAF 1955. 1 and 4 Squadrons. CFS Course 1961.
FLT. LT. H. J. D. PRINCE. Joined RAF 1953. 56 Squadron. CFS Course 1960.
FLT. LT. T. NELSON. Cranwell Cadet 1954/57. 74 and 92 Squadrons.
FLT. LT. F. J. HOARE. Cranwell Cadet 1959/62. CFS Course 1963.
FLT. LT. D. R. H. McGREGOR. Cranwell Cadet 1960/63. CFS Course 1964.

The team pilots are all qualified flying instructors who came from the Royal Air Force Central Flying School at R.A.F. Little Rissington in Gloucestershire. The Central Flying School is the oldest military flying training school in the World and trains flying instructors for the Royal Air Force, the Royal Navy, the Army and for many foreign air forces.

The team flies the Gnat two-seat advanced training aircraft made in Great Britain by Hawker Siddeley. Highly manoeuvrable and with a good transonic performance, the aircraft is very small, having a wing span of only 7.32 m. The engine, which has a static thrust of nearly 2,000 kg., is the Orpheus made by Bristol Siddeley.

The Red Arrows have given displays in France, Germany, Belgium, Holland and Italy besides those in Britain. The display given by the team took three months of intensive training to produce and it is designed to show to the best advantage the manoeuvrability and handling qualities of the aircraft and the flying skill of the pilots.

The display is characterized by the large number of different formations that are flown, most of the changes from one to another being performed when the aricraft are inverted. The most difficult formation to fly in a swept-wing aircraft is "line abreast"; this is demonstrated in several manoeuvres by the team including a roll. "The Red Arrows" are the only team which rolls swept-wing aircraft in this formation.

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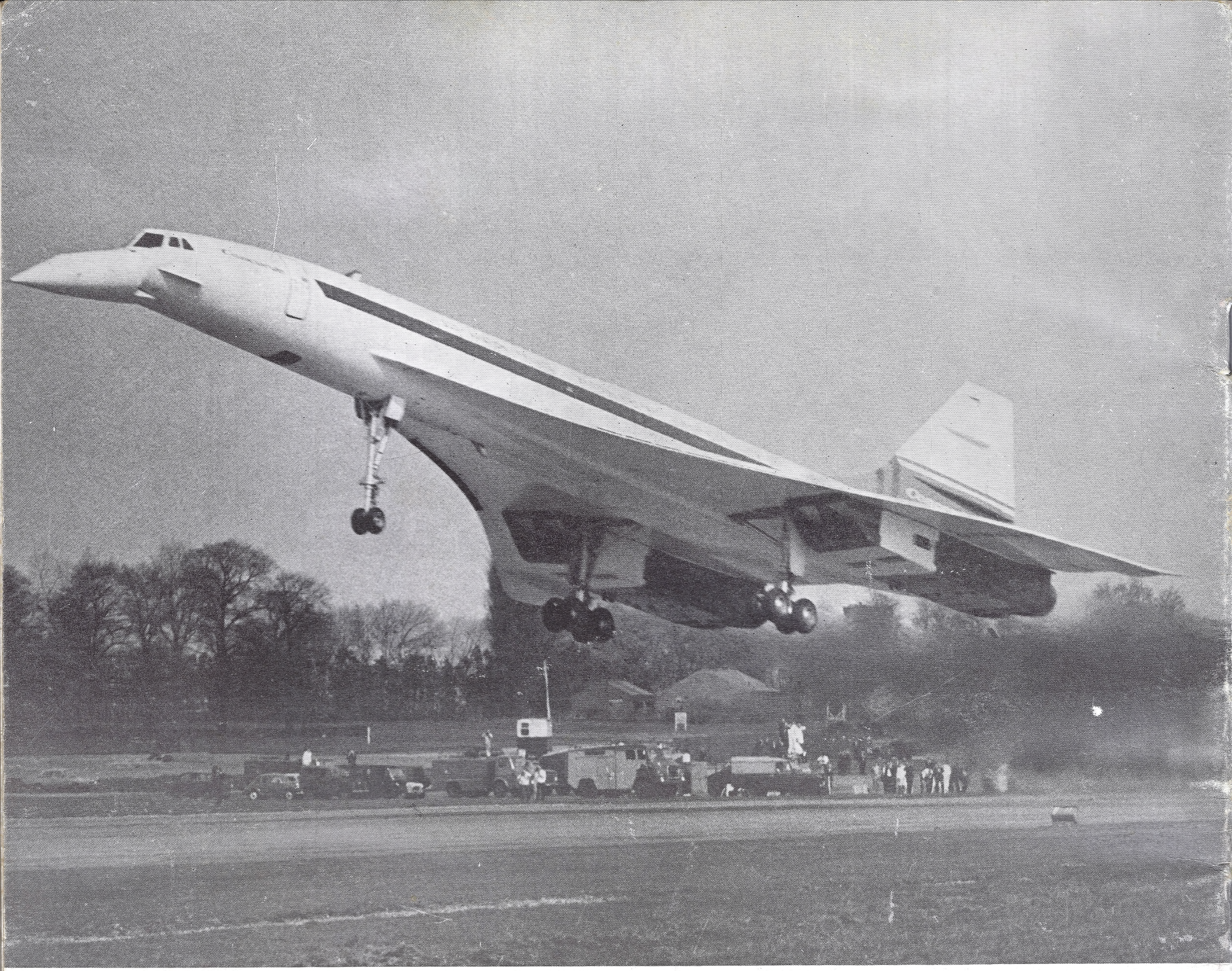

# CONCORDE

002 off on its maiden flight from Filton, Bristol, is now on an extensive series of test flights in preparation to entering service with all major airlines, 16 of which have placed options on a total of 74 aircraft. Due to commence service before 1973.

Specifications, length 193 ft., wing span 83 ft. 10 ins., wing area 3,860 sq. ft. height 38 ft., with a gross weight of 367,000 lb. and maximum payload 25,000 lb., pasengers 125-140. Maximum cruising speed 1,450 m.p.h. (mach. 2.2). Cruising altitude 55,000-62,000 ft. Range of 4,000 miles with full reserves, maximum usable fuel 190,000 lb. Engines are 4 Rolls-Royce SNECMA Olympus 593 turbojets.

001 Seen.................................................... Date..................................

002 Seen.................................................... Date..................................